

WEDNESDAY 19 NOVEMBER 2003: CLASSIC PAPERS AND KEY CONCEPTS IN ATMOSPHERIC PHYSICAL PARAMETRIZATION

Tony Slingo, ESSC, University of Reading: **Key ideas in radiation parametrization**
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-abstract not yet available-

Adrian Tompkins, ECMWF: **The evolution of cloud schemes**

The evolution of cloud schemes in forecast and climate models will be outlined. First, the tasks that cloud schemes have to tackle are addressed. The fact that clouds processes occur on scales smaller than current models resolve (and therefore depend on subgrid-scale fluctuations of dynamic and thermodynamic quantities) is emphasized. It is claimed that many approaches to parameterizing quantities such as cloud cover make implicit assumptions concerning subgrid variability that are often at odds with other model components. The talk concludes with the recent developments in statistical cloud schemes, which explicitly parameterize subgrid fluctuations of temperature/humidity/velocity. Such an approach provides greater coherency between model components and allows biases in radiation and microphysics to be tackled; examples of which will be given.

George Craig, DLR: **The Arakawa-Schubert convection scheme**

-abstract not yet available-

John King, BAS: **The atmospheric surface layer (Monin, Obukhov and after):**

The 1954 paper of Monin and Obukhov is generally regarded as a milestone in our understanding of the non-neutral atmospheric surface layer. Although the authors could not have anticipated it, their concepts underline the parametrisation of surface fluxes used in almost all atmospheric models. In this talk, I will look at the scientific and historical background to the 1954 paper, and discuss how the concepts first expounded there have been applied (and sometimes misapplied) to the problem of surface layer parametrisation.

Steve Derbyshire, Met Office **The Ekman boundary layer and its generalizations**

The classic steady rotating boundary solution is due to Ekman(1905). Based on constant eddy viscosity, it predicts (in the atmospheric case) a surface wind direction at 45 degrees to the isobars, somewhat askew from Buys Ballot's law. Others sought greater realism through different eddy-viscosity assumptions. The stably stratified case requires attention to temperature as well as wind balance. Work by Zilitinkevich (BLM, 1972) and Nieuwstadt (JAS, 1984) brought Monin- Obukhov consistency and can now be seen as "classic papers". Recent GABLS work (www.metresearch.net/gabls) sheds light on the nocturnal jet and its relation to Ekman dynamics.